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INTRODUCTION

OVERVIEW

All COMPAQ personal computers are shipped with a USER PROGRAMS diskette. This diskette contains software utilities that allow you to take advantage of the special features of your COMPAQ personal computer. This guide explains the function of these software utilities and the procedures for their use.

These utilities are designed for use with MS-DOS® Version 3.1 or later as published by Compaq Computer Corporation or Microsoft® Operating System/2 as published by Compaq Computer Corporation. Some utilities may be used with either operating system. Refer to the command sections in Chapter 3, "Utilities for COMPAQ Personal Computers," to determine which commands will run with each operating system.

This guide contains three chapters and four appendixes, as described below:

- Chapter 1 lists and defines each of the software utilities contained in this guide and contains a computer/utility cross reference that shows which utilities may be used with each COMPAQ personal computer.
- Chapter 2 contains procedures for using the INSTALL utility and for copying the user programs files to the fixed disk or to a working MS-DOS diskette.

  NOTE: The INSTALL utility described in this guide is for use with MS-DOS only. Do not attempt to use this utility with any other operating system.

- Chapter 3 contains detailed descriptions of each utility, as well as instructions for installing and using these utilities.
- Appendix A contains information about disk caching.
- Appendix B contains information about memory configurations.
- Appendix C contains technical notes on installation procedures.
- Appendix D contains error messages.

UTILITY SUMMARY

This section contains a brief description of each utility documented in this guide. To see which utilities are used with each COMPAQ personal computer, refer to Table 1-1.

NOTE: COMPAQ PORTABLE 386 and COMPAQ PORTABLE III Personal Computers are equipped with a COMPAQ Dual-Mode Plasma Display.

- ADAPT–The Advanced Display Attribute Programming Tool (ADAPT) utility allows you to change the appearance of characters on the COMPAQ Dual-Mode Plasma Display and set the screen-save option from within an application program.
- CACHE–The CACHE utility provides a technique that improves the time to access fixed disk data for fixed disk drive read-intensive applications, such as databases. This utility is designed for use with any COMPAQ personal computer equipped with a fixed disk drive.
- CEMM–The COMPAQ Expanded Memory Manager (CEMM) utility allows application programs to access memory beyond the 640-Kbyte limit imposed by MS-DOS.
- CHARSET–The CHARSET utility allows you to specify a main and an alternate character set (font) for displaying text on the screen. This utility is designed for use with the COMPAQ Dual-Mode Plasma Display, or a video graphics controller system.
- CLOCK–The CLOCK utility updates the clock on the COMPAQ Asynchronous Communications/Clock Board on the COMPAQ DESKPRO Personal Computer.
- HELP–The HELP utility provides online help for the USER PROGRAMS utilities.

- INSTALL–The INSTALL utility is a menu-based program that allows you to create or modify an MS-DOS *CONFIG.SYS* file in order to install CACHE, CEMM, and VDISK on your fixed disk drive. This utility is designed for use with the MS-DOS operating system only.
- KEYBDP–The KEYBDP utility allows use of the COMPAQ Enhanced Keyboard with the COMPAQ DESKPRO Personal Computer.
- KP–The KP utility allows you to disable your keyboard.
- MODE ATTRIBUTE–The MODE command used with the ATTRIBUTE parameter allows you to change the appearance of highlighted text on the COMPAQ Dual-Mode Plasma Display.
- MODE MEMCACHE–The MODE command used with the MEMCACHE parameter allows you to enable or disable the cache memory controller.
- MODE SCREENSAVE–The MODE command used with the SCREENSAVE parameter allows you to set the number of minutes of inactivity before the screen blanks. This command is used only with a COMPAQ Dual-Mode Plasma Display.
- MODE SELECT–The MODE command used with the SELECT parameter allows you to change the emulation of the currently active video board.
- MODE SPEED–The MODE command used with the SPEED parameter allows you to specify the operating speed of your COMPAQ personal computer.
- VDISK–The VDISK utility allows computer memory to emulate a fixed disk drive. These virtual disks operate much faster than mechanical fixed disk drives.

HOW TO USE THIS GUIDE

Use the following cross reference to determine which utilities are designed for use with your computer.

Table 1-1.
Computer/Utility Cross Reference

	COMPAQ DESKPRO 386/25	COMPAQ DESKPRO 386/20	COMPAQ DESKPRO 386	COMPAQ DESKPRO 386s	COMPAQ DESKPRO 286	COMPAQ DESKPRO	COMPAQ PORTABLE 386	COMPAQ PORTABLE III	COMPAQ PORTABLE II
ADAPT							✔	✔	
CACHE	✔	✔	✔	✔	✔	✔	✔	✔	✔
CEMM	✔	✔	✔	✔			✔		
CHARSET	✔	✔	✔	✔	✔	✔	✔	✔	✔
CLOCK						✔			
HELP	✔	✔	✔	✔	✔	✔	✔	✔	✔
INSTALL	✔	✔	✔	✔	✔	✔	✔	✔	✔
KEYBDP						✔			
KP				✔					
MODE ATTRIBUTE							✔	✔	
MODE MEMCACHE	✔	✔							
MODE SCREENSAVE							✔	✔	
MODE SELECT	✔	✔	✔	✔	✔	✔	✔	✔	✔
MODE SPEED	✔	✔	✔	✔	✔	✔	✔	✔	✔
VDISK	✔	✔	✔	✔	✔	✔	✔	✔	✔

COPYING THE USER PROGRAMS FILES

INTRODUCTION

After installing your operating system, a number of USER PROGRAMS files must be copied to the fixed disk or a working MS-DOS diskette. For many of the utilities, this is the only installation procedure needed.

To complete installation of the CACHE, CEMM, or VDISK utilities, use the INSTALL command or modify the *CONFIG.SYS* file to allow use of these utilities.

The INSTALL utility allows you to install CACHE, CEMM, or VDISK on your fixed disk by copying the appropriate files and creating or modifying a *CONFIG.SYS* file.

NOTE: The INSTALL utility described in this guide is for use with MS-DOS only. Do not attempt to use this utility with any other operating system.

To use the INSTALL utility, perform the following steps.

1. Insert the USER PROGRAMS diskette in drive A.
2. At the MS-DOS prompt, type

   A: INSTALL

   and press the ENTER key.
3. Follow the instructions on the screen.

NOTE: Press the F1 key for help when using the INSTALL utility.

For detailed information on the CACHE, CEMM, INSTALL, and VDISK utilities, refer to the appropriate sections in Chapter 3, "Utilities for COMPAQ Personal Computers."

You have three alternatives for copying the USER PROGRAMS files:

- If your operating system is MS-DOS and you have a fixed disk, you must copy all the files from the USER PROGRAMS diskette to the MS-DOS directory of the fixed disk.
- If your operating system is MS-DOS and you do not have a fixed disk, you must copy all the files from the USER PROGRAMS diskette to your working MS-DOS diskette.
- If your operating system is MS® OS/2, you must copy only certain USER PROGRAMS files to the MS OS/2 directory of the fixed disk.

COPYING FILES TO THE MS-DOS DIRECTORY OF THE FIXED DISK

If you are using MS-DOS as your operating system, you must copy the USER PROGRAMS files to the MS-DOS directory of the fixed disk. Since some of these files are duplicated on the MS-DOS diskette, it is important that you use the latest version of each USER PROGRAMS file.

If you have MS-DOS Version 3.2 or later, use the REPLACE command with the /A (append) and /D (date) switches to copy the files to your fixed disk. An example of how to do this follows:

1. Place the USER PROGRAMS diskette in drive A.
2. Type

   ```
   C:\DOS\REPLACE A:*.* C:\DOS /A
   ```

   and press the ENTER key.

   NOTE: If your MS-DOS files are not in a directory called "\DOS," type the directory name where these files reside instead of typing "DOS" on the command line.

3. Type

   ```
   C:\DOS\REPLACE A:*.* C:\DOS /D
   ```

   and press the ENTER key.

NOTE: You need to issue the REPLACE command twice because the /A switch cannot be used at the same time as the /D switch.

If you have a version of MS-DOS earlier than Version 3.2, the REPLACE command is not available. Since some USER PROGRAMS files are duplicated on the MS-DOS diskette, you must use the DIR command to see which files have the latest date. Then use the COPY command to put the latest version of each file on your fixed disk. For more information on the DIR and COPY commands, refer to your MS-DOS documentation.

COPYING FILES TO YOUR WORKING MS-DOS DISKETTE

If you do not have a fixed disk, you must copy the USER PROGRAMS files to your working MS-DOS diskette. Since some of these files are duplicated on the MS-DOS diskette, it is important that you use the latest version of each USER PROGRAMS file.

If you have MS-DOS Version 3.2 or later, use the REPLACE command with the /A (append) and /D (date) switches to copy the files to your working MS-DOS diskette. An example of how to do this follows:

1. Place the working MS-DOS diskette in drive A and the USER PROGRAMS diskette in drive B.
2. Type

   A:REPLACE B:*.* A: /A

   and press the ENTER key.
3. Type

   A:REPLACE B:*.* A: /D

   and press the ENTER key

NOTE: You need to issue the REPLACE command twice because the /A switch cannot be used at the same time as the /D switch.

If you have a version of MS-DOS earlier than Version 3.2, the REPLACE command is not available. Since some USER PROGRAMS files are duplicated on the MS-DOS diskette, you must use the DIR command to see which files have the latest date. Then use the COPY command to put the latest version of each file on your working MS-DOS diskette. For more information on the DIR and COPY commands, refer to your MS-DOS documentation.

COPYING FILES TO THE MS OS/2 DIRECTORY OF THE FIXED DISK

The KP utility for use with MS OS/2 is included with the USER PROGRAMS files. The following section gives instructions for copying these files to your MS OS/2 directory of the fixed disk.

The KP Utility

The KP utility may be used in the protected mode of MS OS/2, as well as in the MS-DOS environment. To copy the correct file(s) to your fixed disk, follow the steps below:

1. Place the USER PROGRAMS diskette in drive A.
2. Type

   C:\OS2\REPLACE A:KP.* C:\OS2

   and press the ENTER key.

   NOTE: If your MS OS/2 files are not in a directory called "\OS2," type the directory name where these files reside instead of typing "OS2" on the command line.

In order for KP to run in the protected mode of MS OS/2, IOPL = YES must be in the *CONFIG.SYS* file. This is the default set by the MS OS/2 INSTALL utility. Refer to your MS OS/2 documentation for more information on the MS OS/2 INSTALL utility.

UTILITIES FOR COMPAQ PERSONAL COMPUTERS

INTRODUCTION

All of the USER PROGRAMS utilities are explained in detail in this chapter. If you are not sure which utilities may be used with your COMPAQ personal computer, refer to Table 1-1 in Chapter 1, "Introduction."

SYNTAX DESCRIPTION

Certain rules must be followed when entering information into the computer. These rules are called syntax.

How an item appears in the syntax tells you something about that item. For example, when you see an item in lowercase italics, you know that item is a variable and you must supply a value for it.

Example of command syntax:

[*d:*][*path*] CACHE [ON|OFF|CLEAR|HELP]

Example of device driver syntax:

DEVICE = [*d:*][*path*] CACHE.EXE [*vvv*] [ON|OFF] [/BAS|/EXT|/EXP]

This guide uses the following conventions in the syntax of each command or device driver description.

Table 3-1.
Syntax Conventions

Convention	Use
UPPERCASE	Elements shown in uppercase letters indicate the exact text to be entered. You may, however, make your entry in either uppercase or lowercase letters.
lowercase italics	You must supply the text for any of the variables shown in lowercase italics. For example, when *filename* appears, you should type the name of your file.
[ ]	Items in brackets are optional. To include optional information, type only the information within the brackets. Do not type the brackets themselves.
|	A vertical bar means that you must choose from the options on either side of it. For example: ON | OFF means that you are to enter either ON or OFF.
...	An ellipsis means that you can repeat an item as many times as necessary.
separators	Unless otherwise specified, you must use spaces to separate commands from their options.

The command name must be separated from the parameters by a space, comma, semicolon, or an equal sign. In this guide, spaces are used to separate commands and parameters.

It is very important to enter all punctuation marks as they appear in the command syntax. This includes commas, spaces, equal signs, asterisks, question marks, colons, and slashes, but not square brackets or vertical bars.

ADAPT

The Advanced Display Attribute Programming Tool (ADAPT) is a memory-resident program that allows you to determine the display characteristics on a COMPAQ Dual-Mode Plasma Display. Because ADAPT is memory-resident, all changes made through this utility are lost when the computer is reset or turned off.

Purpose:	To change the appearance of highlighted text on the video display from within your application program. It also allows you to change the time interval used by the screen-save feature.
Operating System:	MS-DOS
Syntax:	[*d:*] [*path*] ADAPT [/C]
Command Type:	External
Parameters:	/C This parameter allows you to change the ADAPT activation keys.
Comments:	To use ADAPT on a regular basis, include the ADAPT command in your *AUTOEXEC.BAT* file. NOTE: If both ADAPT and CHARSET are included in your *AUTOEXEC.BAT* file, ADAPT must precede CHARSET. To make permanent changes to the display characteristics, run the SETUP program. For more information on SETUP, refer to *Getting Started* in your *Operations Guide*.

Installing ADAPT

The default keystrokes that activate the ADAPT utility are CTRL and LEFT SHIFT. If this combination of keystrokes does not conflict with the keystroke commands used for other memory-resident utilities, copying the *ADAPT.COM* file onto the fixed disk completes the installation.

If the default keystrokes do conflict with other memory-resident utilities, you may change the combination of keystrokes used to activate ADAPT by following these instructions:

1. At the MS-DOS prompt, type

   ADAPT/C

   and press the ENTER key.

2. Follow the instructions on the screen.

3. Reset the system to put the new keystroke activation combination into effect.

Activating ADAPT

1. If ADAPT has not already been executed through the *AUTOEXEC.BAT* file, type

   ADAPT

   and press the ENTER key to load the program into RAM.

2. Activate ADAPT by pressing the activation keys.

3. The ADAPT Main Menu is displayed. This menu allows you to choose between two selections. These are:

   - *Change the Character Appearance*
     This option allows you to change the appearance of highlighted text.
   - *Set the Inactivity Period for Screen-Save*
     This option allows you to change the inactivity period used by the screen-save feature.

4. To exit from ADAPT, press the ESC key.

Changing Character Appearance

1. If, after activating ADAPT, you choose the *Change the Character Appearance* option from the ADAPT Main Menu, a character appearance screen is displayed. The selection portion of this screen allows you to choose how you want highlighted text to appear. The choices are:

   - Normal Characters
   - Use Alternate Characters

     NOTE: The fonts must have been previously loaded with CHARSET in order for you to be able to see the effect of this option. Refer to the "CHARSET" section in this chapter.

   - Toggle Attribute Feature
   - Half Intensity (default)
   - Reverse Video
   - Underline

2. Use the arrow keys to highlight your choice and press the ENTER key.

   NOTE: If after exiting ADAPT, you decide that the appearance of too much of your text has been changed, you can reverse the effect of the option previously selected. To do so, reactivate ADAPT and select the *Toggle Attribute Feature* option.

   For example, if the option *Underline* was previously selected, and you now select *Toggle Attribute Feature,* the underline is removed from the highlighted text and placed beneath the remaining text.

3. The CURRENT SETTING portion of the screen contains two displays:

   - The *Attribute feature ON* line shows the appearance of highlighted text for the option selected. For example, if you selected the option *Underline,* the words *Attribute feature ON* will be underlined.
   - The *Attribute feature OFF* line shows how the remaining text (that is, text that is not highlighted) will appear in your application.

   When you have made your selection, press the ESC key to exit from this menu. The ADAPT Main Menu reappears.

4. To exit from ADAPT, press the ESC key.

Setting Screen-Save

1. After activating ADAPT, if you select the *Set the Inactivity Period for Screen-Save* option from the ADAPT Main Menu, an inactivity period selection screen is displayed.
2. Enter the desired inactivity period for the screen-save feature. This can be any number of minutes between 1 and 63. If "00" is selected, the screen-save feature is disabled.
3. Your current selection is shown in the CURRENT SETTING portion of the screen. When you have made your selection, press the ESC key to exit from this menu. The ADAPT Main Menu reappears.
4. To exit from ADAPT, press the ESC key.

CACHE

The disk CACHE utility can improve performance by decreasing the time needed to access fixed disk data. Copies of the most recently accessed data and the data expected to be accessed next are placed in a portion of memory called the disk cache. Each time a sector of data is requested, the system checks to see if the data is already in the disk cache. If it is there, the data is transferred to main memory without performing a disk-read operation. This greatly reduces the amount of time needed to retrieve data in applications that are disk read intensive.

The CACHE utility consists of a device driver, *CACHE.EXE,* which is also used as a command file. The CACHE command sets the status of the CACHE device driver and clears or displays disk cache statistics.

The CACHE command allows you to enable or disable CACHE without resetting the system.

For more information on disk caching, refer to Appendix A, "Disk Caching."

The CACHE.EXE Device Driver

Before you can use disk caching, you must install the *CACHE.EXE* device driver in the *CONFIG.SYS* file. This establishes the size of the disk cache.

Purpose:	To allow use of disk caching.
Operating System:	MS-DOS
Syntax:	DEVICE = [*d:*][*path*]CACHE.EXE [vvv] [ON|OFF] [/BAS|/EXT|/EXP]
Installation Method:	Use INSTALL or modify the *CONFIG.SYS* file.
Parameters:	*vvv* This parameter indicates the size of the disk cache in Kbyte units. The default is 256 Kbytes. Values can range from 128 to 2048 Kbytes. All specified values are rounded down to the nearest 16-Kbyte increment. ON This parameter sets the initial state of the *CACHE.EXE* driver to ON. Use this parameter in your *CONFIG.SYS* file to install disk caching, and have it initially enabled. ON is the default. You can disable disk caching later by entering CACHE OFF. OFF This parameter sets the initial state of the *CACHE.EXE* driver to OFF. Use this parameter in your *CONFIG.SYS* file to install disk caching, but have it initially disabled. You can enable disk caching later by entering CACHE ON.

Continued

	/BAS This parameter specifies that memory to be used for cache is allocated from base memory. Base memory is the memory between 0 and 640 Kbytes. /EXT This parameter specifies that memory to be used for cache is allocated from extended memory. Extended memory is all memory above 1 megabyte. This is the default setting. /EXP This parameter specifies that the memory to be used for the disk cache is allocated from expanded memory. Expanded memory is paged memory as defined in the Lotus/Intel/Microsoft (LIM) Expanded Memory Specification (EMS) standard. For more information on expanded memory, refer to Appendix B, "Memory Configuration."
Comments:	Install the CACHE device driver by using the USER PROGRAMS INSTALL utility or by modifying the *CONFIG.SYS* file. Use of the INSTALL utility is covered in the "INSTALL" section in this chapter. If you choose to install the CACHE utility by modifying the *CONFIG.SYS* file without the use of the INSTALL utility, refer to Appendix C, "Installation Notes."

The CACHE Command

After you install the CACHE device driver, use the CACHE command to set the status of the CACHE device driver, to clear or display the disk cache statistics, or to access a HELP screen. For more information on disk caching, refer to Appendix A, "Disk Caching."

Purpose:	To set the status of the CACHE device driver to ON or OFF, to clear disk cache statistics, to display disk cache statistics, or to access a HELP screen.
Operating System:	MS-DOS
Syntax:	[*d:*][*path*]CACHE [ON|OFF|CLEAR|HELP]
Command Type:	External
Parameters:	ON This parameter turns on disk caching and displays the CACHE read statistics screen. OFF This parameter turns off disk caching and displays the CACHE read statistics screen. Any memory assigned to CACHE is released immediately and made available to other applications. CLEAR This parameter sets the read statistics to zero. HELP This parameter displays a screen with instructions for installing CACHE. (None) If no parameters are specified, the CACHE status and CACHE read statistics are displayed.

Continued

Comments: Disk read-intensive applications such as databases benefit the most from disk caching. Performance on other types of applications is usually not affected. If you notice a decrease in performance, turn disk caching off with this command:

```
CACHE OFF
```

When you reset your computer, the status of CACHE returns to the default settings in the *CONFIG.SYS* file.

CEMM

The COMPAQ Expanded Memory Manager (CEMM) is a utility that allows application programs that can use expanded memory, as defined by Lotus/Intel/Microsoft (LIM) Expanded Memory Specification (EMS) standard Version 3.2, to access memory beyond the 640-Kbyte limit imposed by MS-DOS.

The CEMM utility consists of a device driver, *CEMM.EXE,* and a command file, *CEMM.COM.* The CEMM command enables and disables CEMM. When *CEMM.EXE* is loaded by MS-DOS, it makes CEMM expanded memory available and allows other device drivers to load properly if they require expanded memory. The CEMM command can then be used to disable CEMM when it is not needed or when a program runs that uses the protected mode of the 80386. The CEMM command allows you to enable or disable CEMM without resetting the system.

For more information on memory configuration, refer to Appendix B, "Memory Configuration."

The CEMM.EXE Device Driver

Before you can use the CEMM utility, you must install the *CEMM.EXE* device driver in the *CONFIG.SYS* file. This establishes the amount of extended memory that will be used as expanded memory.

Purpose:	To allow you to run application programs that can use expanded memory.
Operating System:	MS-DOS
Syntax:	DEVICE = [*d:*][*path*]CEMM.EXE [*size*] [M*x*] [ON|OFF|AUTO] [W = ON|W = OFF]
Installation Method:	Use INSTALL or modify the *CONFIG.SYS* file.
Parameters:	*size* This parameter indicates the amount of extended memory, in Kbytes, to be used as expanded memory. Every COMPAQ 80386-based personal computer comes with 1 megabyte of standard memory of which 256 Kbytes are extended memory. To use more than 256 Kbytes of extended memory requires installing more memory. Through the use of CEMM, this memory can be used as expanded memory. The valid range is 16 Kbytes to 8192 Kbytes. Values outside this range are converted to the default of 256 Kbytes. If the value you enter is not a multiple of 16 Kbytes, the value is rounded down to the nearest multiple of 16 Kbytes.

Continued

M*x*
This parameter specifies the address of the 64-Kbyte page frame. It is recommended that you do not set the parameter as CEMM will select an available page frame base address.

ON
This parameter specifies that expanded memory will be available after MS-DOS has loaded CEMM.

OFF
This parameter specifies that expanded memory will not be available after MS-DOS has loaded CEMM.

AUTO
This parameter specifies that CEMM will enable expanded memory when it is requested by an application. The default and recommended value for the ON|OFF|AUTO parameter is AUTO mode.

W = ON
This parameter enables the Weitek coprocessor.

W = OFF
This parameter disables the Weitek coprocessor. The default for the W = ON|W = OFF parameter is W = OFF.

Continued

Comments: CEMM is designed to coexist with COMPAQ VDISK(s). Enough extended memory must exist to satisfy both the CEMM expanded memory request and the VDISK extended memory request.

To use the Weitek coprocessor with MS-DOS, you must run CEMM. CEMM translates the physical address of the Weitek coprocessor board to an address space accessible by MS-DOS applications. MS-DOS applications require this address translation to access the Weitek coprocessor.

After installing the Weitek coprocessor, enable the coprocessor by specifying W = ON.

NOTE: Be sure that you have not also specified CEMM OFF, since the OFF parameter would have the effect of overriding W = ON by turning off CEMM entirely.

When not using the Weitek coprocessor, turn off the Weitek support using the CEMM command (CEMM W = OFF). For a discussion of the CEMM command, see "The CEMM Command" section in this chapter.

NOTE: If your system does not contain a Weitek coprocessor, do not specify either W = ON or W = OFF since these parameters are invalid and will cause an error message to appear.

CEMM can be used only with a COMPAQ 80386-based personal computer. Use of the INSTALL utility is covered in the "INSTALL" section in this chapter. Install the CEMM device driver by using the USER PROGRAMS INSTALL utility or by modifying the *CONFIG.SYS* file.

If you choose to install CEMM by modifying your *CONFIG.SYS* file without the use of the INSTALL utility, refer to Appendix C, "Installation Notes."

The CEMM Command

After you install the CEMM device driver, use the CEMM command to set the status of CEMM and to enable or disable the Weitek coprocessor.

Purpose:	To set the status of the CEMM utility to ON, OFF, or AUTO and to enable or disable the Weitek coprocessor.
Operating System:	MS-DOS
Syntax:	[*d*:][*path*]CEMM [ON|OFF|AUTO] [W = ON| W = OFF]
Command Type:	External
Parameters:	ON This parameter enables CEMM expanded memory. OFF This parameter disables CEMM expanded memory. AUTO Using this parameter, CEMM is enabled only when an application requests expanded memory. This is the default setting. W = ON This parameter enables the Weitek coprocessor. W = OFF This parameter disables the Weitek coprocessor.

Continued

Comments:

Do not turn off the CEMM function while the CACHE device driver is operating in expanded memory as it disables the CACHE function. Turning CEMM off when CACHE is functioning from base or extended memory does not affect CACHE.

When you reset your computer, the status of CEMM returns to the default settings in the *CONFIG.SYS* file.

You may want to turn CEMM off under these conditions:

- If you are running an application that operates in protected mode. The following message indicates that CEMM must be turned off:

  ```
  CEMM Privileged operations error # xx
  Deactivate CEMM and Continue (C) or
  reboot (B) (C/B)?
  ```

- If performance is decreased. CEMM adds overhead to the system operation that may decrease performance.

Diskette drive performance will be slower when CEMM is active. To speed up the diskette drive access, use the following command:

```
MODE SPEED = HIGH
```

Continued

It is recommended that MODE SPEED = HIGH be included in the *AUTOEXEC.BAT* file unless you are installing copy-protected software from a diskette. Refer to the "MODE SPEED" section in this chapter, and to your MS-DOS documentation for more information on the MODE SPEED command. For more technical information on the characteristics of CEMM, refer to the Technical Reference Guide for your COMPAQ 80386-based system.

After installing the Weitek coprocessor, enable the coprocessor by specifying W = ON.

NOTE: Be sure that you have not also specified CEMM OFF, since the OFF parameter would have the effect of overriding W = ON by turning off CEMM entirely.

When not using the Weitek coprocessor, turn off the Weitek support using the CEMM command (CEMM W = OFF).

NOTE: If your system does not contain a Weitek coprocessor, do not specify either W = ON or W = OFF since these parameters are invalid and will cause an error message to appear.

CHARSET

The CHARSET utility allows you to customize text characteristics on COMPAQ personal computers containing either a COMPAQ Dual-Mode Plasma Display or a video graphics controller system. You can change the way highlighted fields are displayed by selecting an alternate character set with the CHARSET command.

Purpose:	To select one or two of the available character sets. CHARSET also allows you to specify the character set you want for the main (primary) character set, and which you want for the alternate (secondary) character set.
Operating System:	MS-DOS
Syntax:	[*d:*][*path*]CHARSET [MAIN = [*d:*][*path*]*filename*] [ALT = [*d:*][*path*]*filename*]
Command Type:	External
Parameters:	MAIN This parameter selects the font specified by the filename as the primary character set. ALT This parameter selects the font specified by the filename as the secondary character set.

Continued

filename
This parameter specifies the character set. The available character sets are FONTUS, THINUS, FONTNO, and THINNO.

FONTUS	Standard extended ASCII character set. This is the default character set.
THINUS	Thin-character of FONTUS.
FONTNO	Character set for use in Norway and Denmark.
THINNO	Thin-character version of FONTNO.

Comments:

FONTUS is the default character set for both the main and alternate character set. If this setting is satisfactory, you do not need to use CHARSET.

Before using the CHARSET command, be sure that all USER PROGRAMS files have been copied to your MS-DOS directory.

CHARSET defines the alternate character set used by the ADAPT and MODE ATTRIBUTE commands. For this reason, CHARSET must have been previously executed in order for you to see the effect of the alternate character set when using either ADAPT or MODE ATTRIBUTE. Once CHARSET has been executed, it may be cleared only by resetting the system.

NOTE: If both ADAPT and CHARSET are included in your *AUTOEXEC.BAT* file, ADAPT must precede CHARSET.

Table 3-2 shows various ways in which the command can be issued and the effect of each. Note that the first two commands are default settings.

Table 3-2.
Sample CHARSET Commands

Command	Effect
CHARSET MAIN = FONTUS	Both main and alternate character sets are normal in appearance.
CHARSET ALT = FONTUS	Both main and alternate character sets are normal in appearance.
CHARSET MAIN = THINUS	Main character set is thin in appearance; alternate character set is normal.
CHARSET ALT = THINUS	Main character set is normal in appearance; alternate character set is thin.

CLOCK

The CLOCK utility is required for the COMPAQ DESKPRO Personal Computer to update the clock on the COMPAQ Asynchronous Communications/Clock Board.

The CLOCK.SYS Device Driver

You must install the *CLOCK.SYS* device driver in your *CONFIG.SYS* file if you have a COMPAQ DESKPRO Personal Computer.

Purpose:	To keep the current date and time on a COMPAQ DESKPRO Personal Computer.
Operating System:	MS-DOS
Syntax:	DEVICE = [*d:*][*path*]CLOCK.SYS
Installation Method:	Modify the *CONFIG.SYS* file to include the *CLOCK.SYS* device driver.
Comments:	The *CLOCK.SYS* device driver is not used on the 80286- or 80386-based personal computers. If you try to use it with these computers, you will receive an error message. The first time you start your computer after installing the *CLOCK.SYS* device driver in the *CONFIG.SYS* file, you are prompted to enter the date and time. After this initial setting, MS-DOS keeps the date and time current and automatically loads the date and time when you start your computer.

HELP

HELP is an MS-DOS menu-based utility that provides online help for the USER PROGRAMS utilities. The HELP utility is a portion of what you see when you press the F1 key while using INSTALL.

Purpose:	To provide online help for the USER PROGRAMS utilities.
Operating System:	MS-DOS
Syntax:	HELP
Command Type:	External
Comments:	Press the F1 key to get HELP. Press the F3 key to exit the HELP utility.

INSTALL

INSTALL is a menu-based utility that installs the CACHE, CEMM, and VDISK device drivers. These drivers are placed in your *CONFIG.SYS* file. If you already have one or more of these device drivers in your *CONFIG.SYS* file, you can use INSTALL to modify or delete the parameters currently assigned to these device drivers.

INSTALL also provides an extensive HELP facility. This HELP facility is available at any time while running INSTALL, and includes explanations of error messages, function key use, and information on each of the USER PROGRAMS. To obtain help, press the F1 key and follow the instructions on the screen.

NOTE: The INSTALL utility described in this guide is for use with MS-DOS only. Do not attempt to use this utility with any other operating system.

Purpose:	To install the CACHE, CEMM, and VDISK device drivers.
Operating System:	MS-DOS
Syntax:	INSTALL
Command Type:	External
Comments:	To run INSTALL, you must have MS-DOS Version 3.1 or later as published by Compaq Computer Corporation. If you have an earlier version of MS-DOS, INSTALL terminates and displays the "Incorrect DOS version" message. After you enter changes to an entry panel, you must save the changes by pressing the F2 key. When you exit the INSTALL utility, you must choose the Finish Installation option from the Exit menu to create a new *CONFIG.SYS* file, and to copy any needed files to the directory you specify. You can abort INSTALL at any time by pressing the F3 key or the CTRL + C keys. If you made any changes, INSTALL prompts you to save these changes before returning you to the MS-DOS prompt. You can access the HELP facility at any time by pressing the F1 key.

KEYBDP

The KEYBDP utility allows you to use a COMPAQ Enhanced Keyboard with the COMPAQ DESKPRO Personal Computer.

Purpose:	To use a COMPAQ Enhanced Keyboard with a COMPAQ DESKPRO Personal Computer.
Operating System:	MS-DOS
Syntax:	KEYBDP
Command Type:	External
Installation Method:	Copy the *KEYBDP.COM* keyboard driver to your fixed disk.
Comments:	Add the KEYBDP command to your *AUTOEXEC.BAT* file to automatically load the keyboard driver each time you start the computer.

KP

The KP utility allows you to disable the keyboard with a simple software command.

Purpose:	To disable your keyboard without turning off the computer. KP also allows you to set a temporary keyboard password for use until you turn off the computer.
Operating System:	MS-DOS or MS OS/2
Syntax:	KP [/C]
Command Type:	External
Parameters:	/C This parameter allows you to set a temporary keyboard password for use until you turn off the computer.
Comments:	If you specified a power-on password during SETUP, it also becomes the keyboard password. To disable the keyboard, type KP and press the ENTER key. To enable the keyboard, type the power-on password and press the ENTER key. To change the keyboard password, type KP /C (for change) and follow the instructions to enter a new password. After you press the ENTER key, the keyboard is disabled and you must enter the new password to enable the keyboard.

Continued

If you want to disable the keyboard and you did not specify a power-on password during SETUP, type KP and follow the instructions to enter a password. After you press the ENTER key, the keyboard is disabled and you must enter the password to enable the keyboard. This password remains in effect until you turn off the computer.

NOTE: For detailed information on the power-on password refer to *Getting Started* in your *Operations Guide*.

The keys on the numeric keypad produce a different password than the keys on the main section of the keyboard.

Press the F1 key for help while using the KP command.

MODE ATTRIBUTE

The MODE ATTRIBUTE command allows you to set certain display options of the COMPAQ Dual-Mode Plasma Display. Using the MODE command with this option is equivalent to changing the character appearance of highlighted text by using the ADAPT utility. Selections made through MODE ATTRIBUTE remain in effect unless changed through ADAPT or until you turn off or reset your computer.

Purpose:	To change the appearance of highlighted text on the COMPAQ Dual-Mode Plasma Display.
Operating System:	MS-DOS
Syntax:	[*d:*][*path*]MODE ATT[RIBUTE] [=] ALT[ERNATE] | HAL[F] | REV[ERSE] | UND[ERLINE] | IGN[ORE] | TOG[GLE]
Type:	External
Parameters:	ALT[ERNATE] This parameter uses an alternate character font for highlighted text. This font must have been previously loaded with CHARSET. Refer to the "CHARSET" section in this chapter. HAL[F] This parameter uses half-intensity for highlighted text. This is the default mode for the COMPAQ Dual-Mode Plasma Display.

Continued

REV[ERSE]
This parameter uses reverse video for highlighted text.

UND[ERLINE]
This parameter underlines highlighted text.

IGN[ORE]
This parameter disables highlighting.

TOG[GLE]
This parameter reverses highlighted and normal text. For example, if you selected UNDERLINE and then selected TOGGLE, all text would be underlined except highlighted text.

MODE MEMCACHE

Cache memory is a 32-Kbyte section of high-speed static RAM that stores data retrieved from the relatively slower dynamic RAM used for system memory. Data is temporarily stored in the cache memory in anticipation of future use by the CPU. If requested data is found in the cache memory, the data is transferred directly to the CPU at 0 wait states, thereby greatly improving performance of the system. This memory is managed by the cache memory controller.

Purpose:	To enable or disable the cache memory controller.
Operating System:	MS-DOS
Syntax:	[*d*:][*path*]MODE MEM[CACHE] [ON|OFF]
Command Type:	External
Parameters:	ON This parameter enables the cache memory controller. This is the default setting. OFF This parameter disables the cache memory controller. (None) The MODE MEMCACHE command issued with no parameters allows you to display the current status of the cache memory controller.
Comments:	When you reset your computer, the cache memory controller returns to the default setting.

MODE SCREENSAVE

The MODE SCREENSAVE command allows you to set certain display options of the COMPAQ Dual-Mode Plasma Display. Using the MODE command with this option is equivalent to setting the inactivity period for screen-save by using the ADAPT utility. Selections made through MODE SCREENSAVE remain in effect unless changed through ADAPT or until you turn off or reset your computer.

Purpose:	To set the number of minutes of inactivity before the screen blanks.
Operating System:	MS-DOS
Syntax:	[*d:*][*path*]MODE SCR[EENSAVE] [=] *n*
Command Type:	External
Parameters:	*n* This parameter is the number of minutes of inactivity before the screen blanks.
Comments:	The value of *n* can be any number of minutes between 1 and 63. If "00" is selected, the screen-save feature is disabled.

MODE SELECT

If you have two monitors connected to your computer, you can use the MODE SELECT command to easily change the emulation of the currently active video board.

Purpose:	To display or change the emulation of the currently active video board.
Operating System:	MS-DOS
Syntax:	[*d:*][*path*]MODE SEL[ECT] [=] [CGA | MDA | EGA COLOR | EGA MONO]
Command Type:	External
Parameters:	CGA This parameter may only be specified on personal computers containing a COMPAQ Dual-Mode Plasma Display. It is the default value on all other COMPAQ personal computers. This variable puts the active video adapter into IBM Color Graphics Adapter (CGA) emulation mode. MDA This parameter is only used on personal computers with a COMPAQ Dual-Mode Plasma Display or a COMPAQ Dual Scan Monitor. It puts the active video adapter into IBM Monochrome Display Adapter (MDA) emulation mode. EGA COLOR This parameter is only used on personal computers with an enhanced color graphics board. It puts the active video adapter into color IBM Enhanced Graphics Adapter (EGA) emulation mode.

Continued

	EGA MONO This parameter is only used on personal computers with an enhanced color graphics board. It puts the active video adapter into monochrome IBM Enhanced Graphics Adapter (EGA) emulation mode. The active board-monitor combination must support monochrome EGA; a monochrome adapter cannot be present in the system.
Comments:	The MODE SELECT command issued with no parameters displays the emulation of the currently active video board. To change the emulation of the currently active video board, issue the MODE SELECT command with one of the parameters listed. When you reset your computer, the emulation of the currently active video board returns to the default setting.

MODE SPEED

All COMPAQ personal computers have a default operating speed. The MODE SPEED utility allows you to change the operating speed of your computer, if needed for compatibility with certain application programs. There are five operating speeds: COMMON, FAST, HIGH, AUTO, and *n*. The actual speed that is set with each varies with the model of COMPAQ personal computer.

Purpose:	To display or change the operating speed.
Operating System:	MS-DOS
Syntax:	[*d:*][*path*]MODE SPE[ED] [=][COM[MON] | FAS[T] | HIG[H] | AUT[O] | *n*]
Command Type:	External
Parameters:	COM[MON], FAS[T], HIG[H], AUT[O] The MODE SPEED command issued with a parameter allows you to change the operating speed of your COMPAQ personal computer. Three tables are provided that show how the operating speed of a COMPAQ personal computer may be changed. *n* The *n* parameter is only available on COMPAQ 80386-based personal computers. You can specify a speed value within the range 1 to 50. (None) The MODE SPEED command issued with no parameters displays the current operating speed of your COMPAQ personal computer.

Continued

Comments:	If you have an 8086- or 80286-based personal computer, the operating speed returns to the default setting when you reset or turn off your computer. If you have an 80386-based personal computer, the operating speed returns to the default setting only when you turn off the computer.

The following table shows the operating speeds set by each MODE SPEED parameter on COMPAQ 80386-based personal computers.

Table 3-3.
Operating Speeds Set by MODE SPEED Parameters on COMPAQ 80386-Based Personal Computers

Command	16-MHz 80386-Based Computers	20-MHz 80386-Based Computers	25-MHz 80386-Based Computers
AUTO	16-MHz CPU* ** 8-MHz bus	20-MHz CPU* ** 8-MHz bus	25-MHz CPU* ** 8-MHz bus
HIGH	16-MHz CPU 8-MHz bus	20-MHz CPU 8-MHz bus	25-MHz CPU 8-MHz bus
FAST	8-MHz CPU 8-MHz bus	8-MHz CPU 8-MHz bus	8-MHz CPU 8-MHz bus
COMMON	6-MHz CPU 8-MHz bus	6-MHz CPU 8-MHz bus	6-MHz CPU 8-MHz bus

*Indicates default speed
**CPU speed is reduced to 8 MHz during diskette access

The following table shows the operating speeds set by each MODE SPEED parameter on COMPAQ 8086- and 80286-based personal computers.

Table 3-4.
Operating Speeds Set by MODE SPEED Parameters on COMPAQ 8086- and 80286-Based Personal Computers

Command	8086-Based Computers	8-MHz 80286-Based Computers	12-MHz 80286-Based Computers
AUTO	Not Supported	Not Supported	12-MHz CPU* ** 8-MHz bus
HIGH	Not Supported	8-MHz CPU* 8-MHz bus	12-MHz CPU 8-MHz bus
FAST	7.14-MHz CPU* 4.77-MHz bus	8-MHz CPU 6-MHz bus	8-MHz CPU 8-MHz bus
COMMON	4.77-MHz CPU 4.77-MHz bus	6-MHz CPU 6-MHz bus	Not Supported

*Indicates default speed
**CPU speed is reduced to 8 MHz during diskette access

The following table shows how the CTRL + ALT + \ keystroke option toggles between operating speeds on COMPAQ personal computers.

Table 3-5.
Effect of CTRL + ALT + \ Keystroke Option on Operating Speeds of COMPAQ Personal Computers

Computer System	Effect of Keystroke Option
8086-Based Computers	Toggles between FAST (GREEN LED) and COMMON (RED LED).
8-MHz 80286-Based Computers	Toggles between HIGH (2 beeps) and COMMON (1 beep).
12-MHz 80286-Based Computers	Toggles between AUTO (2 beeps) and FAST (1 beep).
80386-Based Computers	Not Supported

NOTE: This option is activated by the CTRL, ALT, **and** \ keys on U.S. English keyboards. The activation keys differ on some other keyboards.

VDISK

VDISK allows you to use a portion of the computer memory as a disk drive. These disks are referred to as virtual disks (VDISKs) and are much faster than mechanical disk drives as they operate at the speed of your computer memory. VDISKs provide the same function as RAM disks. Any files on the VDISK are lost when power to the computer is interrupted. Therefore, any data that is to be retained must be stored on a physical diskette or fixed disk before turning off or resetting your computer.

The VDISK.SYS Device Driver

You must install the *VDISK.SYS* device driver in the *CONFIG.SYS* file to set the size of the virtual disk. This also establishes whether the VDISK is created in base memory or extended memory. For more information on memory configuration, refer to Appendix B, "Memory Configuration."

Purpose:	To create a virtual fixed disk drive in base or extended memory.
Operating System:	MS-DOS
Syntax:	DEVICE = [*d:*][*path*]VDISK.SYS [*comment*][*nnn*] [*comment*][*sss*][*comment*][*ddd*][*comment*][/E[:*t*]] [*comment*]
Installation Method:	Use INSTALL or modify the *CONFIG.SYS* file
Parameters:	*comment* This parameter is an optional comment to explain the parameter. The comment must be a sequence of ASCII characters not including carriage return, line feed, or / (slash). *nnn* This parameter is the VDISK size given in Kbytes. Its range is from 1 Kbyte to the maximum amount of memory available in your system. The amount of memory available is 64 Kbytes less than the total amount of memory in your computer.

Continued

sss
This parameter is the number of bytes per sector. The acceptable values are 128, 256, and 512.

ddd
This parameter is the number of directory entries. Its range is from 2 to 512 entries. This is the number of files you may have in the VDISK and includes one entry for the disk label.

/E
This parameter is the extended memory switch. This causes VDISK to create your virtual disk in memory at or above 1 megabyte. The device driver is installed in base memory. The size of the VDISK can be as large as the amount of extended memory.

You can request more than one VDISK in extended memory by placing more than one DEVICE = VDISK.SYS command with the /E switch in your *CONFIG.SYS* file. Multiple virtual disks are created sequentially in your extended memory. If this switch is used with a machine that does not have extended memory, VDISK issues an error message and does not install a virtual disk.

:*t*
This parameter is the maximum number of sectors to transfer to extended memory at one time. Its range is from 1 to 8 sectors.

Continued

Comments: To prevent possible loss of data, copy your data from the virtual disk to a fixed disk or diskette before you reset or turn off your system.

Extended memory beyond the 1-megabyte address space can be used to create a VDISK.

VDISKs can coexist with expanded memory. You are allowed to create as many VDISKs as you have space for, but only 12 VDISKs can be installed through the INSTALL program.

A VDISK can be installed by using the USER PROGRAMS INSTALL utility or by modifying the *CONFIG.SYS* file. Use of the INSTALL utility is covered in the "INSTALL" section in this chapter.

If you choose to modify your *CONFIG.SYS* file without the use of the INSTALL utility, refer to Appendix C, "Installation Notes."

DISK CACHING

Disk caching can improve performance by decreasing the time needed to access fixed disk data. Copies of the most recently accessed data and the data expected to be accessed next are placed in a portion of memory called the disk cache. Since data transfer rates from memory are many times faster than fixed disk transfer rates, most disk read-intensive applications, such as databases, show improved performance with disk caching. Other applications, such as spread sheets and word processing systems, may show little or no gain in performance.

Each time a sector of data is requested, the *CACHE.EXE* device driver reads both the requested sector and adjacent sectors. On the next request, the system checks to see if the requested data is already in the disk cache. If it is there, no disk-read operation is performed, and the requested data is transferred from the disk cache memory to the main memory.

The number of sectors stored in disk cache memory is dependent on the amount of memory allocated for disk cache in your *CONFIG.SYS* file. When the disk cache is full, sectors that have been in the cache the longest without being accessed are replaced with the data being requested. This allows the data being used most frequently to remain in the cache. To determine the amount of memory to allocate to disk cache for optimum performance, experiment with various disk cache sizes using your application and data files.

If the read request is for a large number of sectors, data is not put into the disk cache. An example of when this might occur is when a large program is loaded. In this instance, the data is not put into the disk cache, thereby causing the fixed disk drive to be accessed if the program is reloaded.

If the operation being performed is a write command, the data in the disk cache is updated prior to the actual disk-write operation. This ensures that the data in the cache and the data on the disk match before returning to the program.

In some cases, disk caching does not increase system performance and you should disable the disk cache. This can occur if an application program reads data from the fixed disk drive in a random fashion such that only one sector of data is used from each disk cache access. In that situation, the added overhead of repeatedly moving unused data from the fixed disk drive to the disk cache causes a decrease in performance.

Disk caching is not supported for a diskette drive because the diskette can be removed and replaced with a different diskette without the disk caching program being aware of it. Access to network files is not cached because the request is routed to the network server in a manner different from normal disk requests.

MEMORY CONFIGURATION

Three types of random access memory (RAM) are available for use on your COMPAQ personal computer. These are base, extended, and expanded memory. Figure B-1, Base, Extended, and Expanded Memory, shows the relationship and address boundaries of these three types of memory.

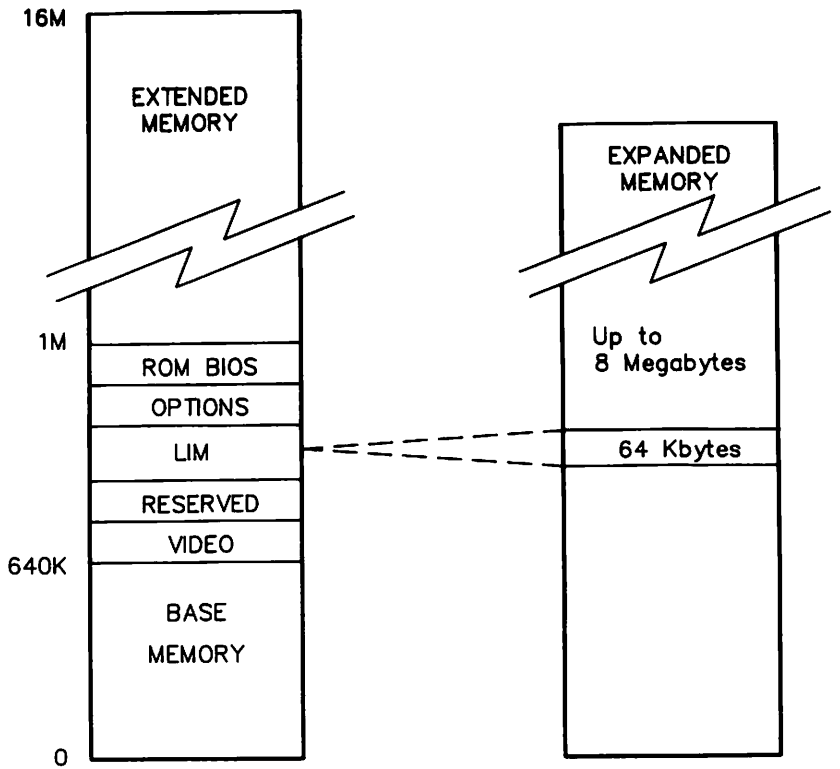

Figure B-1. Base, Extended, and Expanded Memory

BASE MEMORY

Base memory is the memory between 0 and 640 Kbytes that MS-DOS uses for the operating system, application program execution, and data storage.

EXTENDED MEMORY

Extended memory is memory above the 1-megabyte boundary that cannot normally be accessed by MS-DOS applications. Special software utilities, such as CACHE and VDISK, have been designed to make use of this memory. It is also possible for sophisticated MS-DOS applications to use this memory if certain conventions are observed. All COMPAQ 80386-based personal computers include 256 Kbytes of extended memory. For all other COMPAQ personal computers, extended memory may be implemented by adding memory options.

EXPANDED MEMORY

Expanded memory is pageable memory that conforms to a standard created by the Lotus, Intel, and Microsoft corporations. This standard is referred to as the LIM Expanded Memory Specification (EMS) standard after the companies that created it.

This memory option provides additional memory for use by applications that take advantage of the LIM standard. This type of memory may be implemented with a hardware device supported by a software driver or by software alone, such as the COMPAQ Expanded Memory Manager (CEMM). CEMM supports LIM Version 3.2 and is available on all COMPAQ 80386-based personal computers.

Application programs access expanded memory via four adjacent 16-Kbyte windows in the address space. These four windows form a 64-Kbyte page frame. The beginning address of the page frame is configurable and is located in the address range above video memory. To use expanded memory, an application program uses the Expanded Memory Manager (EMM) software to map a 16-Kbyte page of expanded memory into one of the four 16-Kbyte windows of the page frame.

INSTALLATION NOTES

INSTALLING CACHE

If you choose to install the CACHE utility by modifying the *CONFIG.SYS* file without the use of the INSTALL utility, the following rules apply:

- You must insert the *CACHE.EXE* device driver after any expanded memory device driver in the *CONFIG.SYS* file.
- If you install a RAM disk other than a COMPAQ VDISK, the RAM disk device driver must be listed after the CACHE device driver in the *CONFIG.SYS* file.
- *CACHE.EXE* should be loaded only once, regardless of the number of partitions or fixed disk drives you have.
- Disk caching is only available for the first two physical fixed disk drives in your system. However, it operates for all logical drives associated with the two physical fixed disk drives.

Example

The following example illustrates a typical installation of the CACHE utility on a COMPAQ 80386-based personal computer.

System type:	80386-based system
Machine configuration:	COMPAQ 80386-based personal computer with 1 megabyte of additional extended memory.
Desired Installation:	You want to install a 512-Kbyte disk cache to operate in extended memory.
Instructions:	Use the INSTALL program to install the necessary parameters, or add this line to the *CONFIG.SYS* file: DEVICE = CACHE.EXE 512 /EXT This command creates a disk cache of 512 Kbytes in extended memory.

INSTALLING CEMM

Install the CEMM device driver by using the USER PROGRAMS INSTALL utility or by modifying the *CONFIG.SYS* file. CEMM can be used only with a COMPAQ 80386-based personal computer.

If you choose to install CEMM by modifying your *CONFIG.SYS* file without the use of the INSTALL utility, the following rules apply:

- The *CEMM.EXE* device driver must appear in the *CONFIG.SYS* file before all other device drivers that use expanded memory.
- If you install a RAM disk other than a COMPAQ VDISK, the RAM disk device driver must be listed after the CEMM and CACHE device drivers in the *CONFIG.SYS* file.

CEMM Parameter Notes

Mx

If you have page frame address conflicts, you can select a value from Table C-1 that does not conflict with any options or applications that you have installed.

Table C-1.
Page Frame Base Addresses.

x	Memory Address
1	0C0000
2	0C4000
3	0C8000
4	0CC000
5	0D0000
6	0D4000
7	0D8000
8	0DC000
9	0E0000
10	080000
11	084000
12	088000
13	08C000
14	090000

NOTE: For addresses M10, M11, M12, M13, and M14, the base memory must be set to 512 Kbytes or less by setting the appropriate system board switches or jumpers.

INSTALLING VDISK

If you choose to modify your *CONFIG.SYS* file without the use of the INSTALL utility, add the DEVICE = VDISK.SYS command to the *CONFIG.SYS* file and reset the system. The device drivers are installed in the *CONFIG.SYS* file in the following order:

ENHDISK
VDISK(s)
CEMM
CACHE
All other device drivers — in their original order and including any VDISKs beyond the first 12 VDISKs

You can request more than one VDISK by repeating this command for each drive that is to be installed. Since VDISK assigns unique drive specifiers to each VDISK created, you can access information from them just as you would from standard fixed disk drives.

You can customize the VDISK by including parameters on the command line for virtual disk size, sector size, and number of directory entries. If you have extended memory installed in your computer, use the /E switch to create a virtual disk in memory at or above 1 megabyte. Otherwise, VDISK uses base memory. You can also specify the number of sectors to transfer during a data transfer operation.

Example

The following command line in your *CONFIG.SYS* file creates a VDISK in extended memory with a disk size of 200 Kbytes, 256 bytes per sector, and 16 directory entries:

```
DEVICE = VDISK.SYS  200  256  16 /E:4
```

Only 4 sectors of data are transferred to extended memory at a time during a data transfer.

VDISK Parameter Notes

nnn

If you do not specify a size, VDISK defaults to 64 Kbytes. If you request a disk size greater than the total amount of memory you have available, VDISK adjusts the virtual disk size downward to leave 64 Kbytes available after your virtual disk has been installed. Anytime VDISK adjusts the virtual disk size, it issues a "buffer size adjusted" message.

If you specify a VDISK size such that less than 64 Kbytes of available memory remains, VDISK will not install the virtual disk and exits with an error message.

sss

The acceptable values are 128, 256, and 512. If you enter any other number, VDISK adjusts the sector size upward to the next acceptable value and issues a "Sector size adjusted" message. If the total number of sectors exceeds 65535, VDISK doubles the sector size.

ddd

This parameter specifies the number of files you may have in the VDISK and includes one entry for the disk label. Its range is from 2 to 512 entries. If you do not specify a number, or if you enter a value less than 2 or greater than 512, VDISK uses a default value of 64 entries. When VDISK defaults to 64 entries, it displays a "directory entries adjusted" message.

VDISK also calculates the number of entries required to fill out a complete sector and adjusts the number of directory entries upward accordingly. The number of directory entries is adjusted downward if there are not enough sectors remaining in the virtual disk for at least 1 boot sector, 1 File Attribute Table (FAT) sector, 1 directory sector, and 1 data sector. Any time VDISK adjusts the number of directory entries, it issues a "directory entries adjusted" message.

:t

This parameter specifies the maximum number of sectors to transfer to extended memory at one time. Its range is from 1 to 8 sectors. VDISK will default to 8 sectors and issue a "Transfer size adjusted" message if you do not specify a value, or if you specify a value that is out of range. Having the ability to adjust the transfer size is necessary since interrupt servicing is suspended during data transfers to extended memory, and interrupts may be lost if you transfer a large amount of data at one time when frequent interrupts are occurring.

ERROR MESSAGES

This section contains a list of messages that may be issued while installing or running the USER PROGRAMS utilities. The probable cause of each error message and the remedial action to take is also described.

MESSAGE:	Activation key(s) unchanged.
CAUSE:	ADAPT The activation key setting was not changed, or the user elected not to save the new setting.
ACTION:	Reissue the ADAPT/C command to reset the activation keys or if the previous setting is acceptable, no action is required.
MESSAGE:	ADAPT is already resident.
CAUSE:	ADAPT An attempt was made to load ADAPT when it was already resident.
ACTION:	Use the activation key sequence to access ADAPT.
MESSAGE:	Adapter boards conflict.
CAUSE:	MODE SELECT The requested emulation mode conflicts with a second installed adapter.
ACTION:	Turn off the power and remove the second adapter. Enter the command again.

MESSAGE:	Buffer size adjusted.
CAUSE:	VDISK The virtual disk that has been installed is smaller than what you specified. VDISK has adjusted the virtual disk size downward to leave 64 Kbytes available after the virtual disk has been installed.
ACTION:	None.
MESSAGE:	CACHE Not Installed.
CAUSE:	CACHE CACHE has not been installed as a device driver.
ACTION:	The *CACHE.EXE* device driver for disk caching must be added to the *CONFIG.SYS* file, and the system must be reset.
MESSAGE:	CACHE not installed — Disk Error.
CAUSE:	CACHE A disk error occurred.
ACTION:	Check to see if the fixed disk drive and the controller are installed properly. If you still receive this message, run User Diagnostics and contact your Authorized COMPAQ Computer Dealer and describe the conditions that produced this message.
MESSAGE:	CACHE not installed — Expanded Memory Error.
CAUSE:	CACHE An error was returned from the expanded memory manager while installing *CACHE.EXE*.
ACTION:	Verify the correct installation of the expanded memory manager.

MESSAGE:	CACHE not installed — Extended memory not supported on this machine.
CAUSE:	CACHE The /EXT switch has been used on a computer that is not an 80286- or 80386-based system.
ACTION:	Edit the *CONFIG.SYS* file to configure CACHE with either the applicable /BAS or /EXP switch.
MESSAGE:	CACHE not installed — Incorrect DOS Version.
CAUSE:	CACHE An attempt was made to use CACHE with an incorrect version of MS-DOS.
ACTION:	Install MS-DOS Version 3.1 or later as published by Compaq Computer Corporation prior to using CACHE.
MESSAGE:	CACHE not installed — Insufficient Memory.
CAUSE:	CACHE You do not have enough system memory to create a disk cache of the size specified.
ACTION:	Use the installation utility or edit your *CONFIG.SYS* file to specify less memory.
MESSAGE:	CACHE not installed — Invalid Parameter.
CAUSE:	CACHE You entered an invalid parameter in the device = command in your *CONFIG.SYS* file.
ACTION:	Edit your *CONFIG.SYS* file to correct the error.

MESSAGE:	CACHE not installed — Memory Not Available.
CAUSE:	CACHE Expanded or extended memory is not available on your system.
ACTION:	Verify that expanded or extended memory is installed in your system and that the expanded memory driver is listed before the *CACHE.EXE* driver in your *CONFIG.SYS* file.
MESSAGE:	Cannot find file <FILESPEC.Fyy>; 8xYY font not loaded.
CAUSE:	CHARSET The font file specified on the command line cannot be found.
ACTION:	Enter a correct font file.
MESSAGE:	CEMM.EXE already installed.
CAUSE:	CEMM *CEMM.EXE* was installed before this device driver was loaded.
ACTION:	None.
MESSAGE:	CEMM Exception error #xx — press enter to reboot.
CAUSE:	CEMM An unrecoverable virtual mode exception occurred.
ACTION:	Press the ENTER key.

MESSAGE:	CEMM is not installed.
CAUSE:	CEMM An attempt is made to set the status of CEMM and the CEMM driver has not been installed.
ACTION:	Install the CEMM driver prior to setting the CEMM status.
MESSAGE:	CEMM not installed — incorrect DOS version.
CAUSE:	CEMM An attempt was made to use CEMM with an incorrect version of MS-DOS.
ACTION:	Install MS-DOS Version 3.1 or later as published by Compaq Computer Corporation prior to installing CEMM.
MESSAGE:	CEMM not installed — incorrect machine type.
CAUSE:	CEMM CEMM can only be installed on a COMPAQ 80386-based product.
ACTION:	CEMM can only be used on a COMPAQ 80386-based personal computer.
MESSAGE:	CEMM not installed — insufficient memory.
CAUSE:	CEMM There is not enough extended memory to create a minimal pool of expanded memory, or there is less than 64 Kbytes of base memory left after installing CEMM.
ACTION:	Add additional memory.

MESSAGE:	CEMM not installed — unable to set page frame base address.
CAUSE:	CEMM The page frame base address (M*x* parameter) was not specified in the *CONFIG.SYS* file and CEMM was not able to find an available address range for the 64-Kbyte page frame.
ACTION:	Prior to installing CEMM, make 64 Kbytes of address space available with a starting address specified in Table C-1. Refer to Appendix C for information on the M*x* parameter to determine the page frame boundaries.
MESSAGE:	CEMM Privileged operation error #xx Deactivate CEMM and Continue (C) or reboot (B)(C / B)?
CAUSE:	CEMM An MS-DOS program is attempting to execute an instruction which cannot be executed in virtual mode.
ACTION:	Enter the selected choice: press C (continue) or B (reboot).
MESSAGE:	CHARSET already installed.
CAUSE:	CHARSET CHARSET is already installed.
ACTION:	The system must be reset to change the character fonts.

MESSAGE:	CHARSET not installed.
CAUSE:	CHARSET An error was encountered that caused the utility to abort. A font type may have been specified, MAIN or ALT, and no files could be successfully loaded for that font.
ACTION:	Verify that the font files are available in the specified path. Issue the CHARSET command again.
MESSAGE:	Directory entries adjusted.
CAUSE:	VDISK The number of directory entries you specified is not acceptable for one of several reasons. VDISK has adjusted the number of directory entries accordingly. See Appendix C of this guide for a discussion of how this adjustment was made.
ACTION:	None.
MESSAGE:	Emulation mode unsupported.
CAUSE:	MODE SELECT The active display adapter does not support the requested mode.
ACTION:	Request another emulation mode or switch to another display adapter and enter the command again.

MESSAGE:	Error accessing disk file ADAPT.COM.
CAUSE:	ADAPT An error occurred while ADAPT was trying to save the new activation key setting to the disk copy of *ADAPT.COM*. The new setting is not saved.
ACTION:	Check the setting of the MS-DOS path to make certain that the *ADAPT.COM* file resides in one of the directories specified.
MESSAGE:	ERROR ACCESSING <EXPANDED, EXTENDED> MEMORY — Disk Caching Disabled
CAUSE:	CACHE An expanded or extended memory error occurred while trying to access data in the disk cache.
ACTION:	No action is required at this time; however, before running CACHE again, check the validity of the extended memory or the correct operation of the expanded memory manager, then reset the system.
MESSAGE:	Error: Help index could not be loaded.
CAUSE:	INSTALL The USER PROGRAMS HELP utility could not be loaded.
ACTION:	None.
MESSAGE:	Error: Invalid device driver path or name.
CAUSE:	INSTALL In the line edit mode, an invalid device driver or path name has been entered.
ACTION:	Enter a valid device driver path.

MESSAGE:	Error: Maximum base memory size is 640 Kbytes.
CAUSE:	INSTALL An invalid amount has been specified for base memory.
ACTION:	None.
MESSAGE:	Error reading from file <FILESPEC.Fyy>
CAUSE:	CHARSET An error occurred while reading from the font file filespec, or the file contained less than the required number of characters to represent a particular font.
ACTION:	The name of the font file must agree exactly with the name of the USER PROGRAMS file. Recopy the USER PROGRAMS font file and issue the CHARSET command again.
MESSAGE:	Incorrect DOS version.
CAUSE:	ADAPT, CHARSET, INSTALL, MODE An attempt was made to use the utility with the incorrect version of MS-DOS.
ACTION:	Use the correct version of MS-DOS. ADAPT requires MS-DOS Version 3.0 or later as published by Compaq Computer Corporation. CHARSET requires MS-DOS Version 2 or later as published by Compaq Computer Corporation. INSTALL requires MS-DOS Version 3.1 or later as published by Compaq Computer Corporation. MODE requires MS-DOS Version 3.1 or later as published by Compaq Computer Corporation.

MESSAGE:	Invalid number of parameters.
CAUSE:	CHARSET
	No filename was specified, or multiple MAIN or ALT character sets were specified.
ACTION:	Enter the command with the correct parameters.
MESSAGE:	INVALID PARAMETER Usage: CACHE [ON | OFF | CLEAR | HELP]
CAUSE:	CACHE
	You entered an invalid parameter on the command line.
ACTION:	Enter the command again using one of the specified command line parameters.
MESSAGE:	Invalid parameters.
CAUSE:	Various MODE commands.
	You entered one or more invalid parameters.
ACTION:	Refer to the description of the particular MODE command you are using to determine which parameters can be used with your computer.
MESSAGE:	Invalid parameter string.
CAUSE:	ADAPT, CHARSET
	The ADAPT or CHARSET command was entered with an unrecognized parameter (string) on the command line.
ACTION:	Enter a valid parameter.
MESSAGE:	Invalid parameter specified.
CAUSE:	CEMM
	An invalid parameter or invalid value has been specified.
ACTION:	Enter a valid parameter or value.

MESSAGE:	Invalid switch character.
CAUSE:	VDISK
	You entered an invalid switch character other than /E in the command line.
ACTION:	Retry the operation, entering a valid switch character.
MESSAGE:	Memory Cache already OFF.
CAUSE:	MODE MEMCACHE
	The OFF parameter to the MEMCACHE option has been specified while the cache memory controller is disabled.
ACTION:	None.
MESSAGE:	Memory Cache already ON.
CAUSE:	MODE MEMCACHE
	The ON parameter to the MEMCACHE option has been specified while the cache memory controller is enabled.
ACTION:	None.
MESSAGE:	Memory Cache Controller not present <bell>.
CAUSE:	MODE MEMCACHE
	The MEMCACHE option has been specified on a system that does not support caching.
ACTION:	None.
MESSAGE:	Memory Cache turned OFF.
CAUSE:	MODE MEMCACHE
	The OFF parameter to the MEMCACHE option has been specified while the cache memory controller is disabled.
ACTION:	None.

MESSAGE:	Memory Cache turned ON.
CAUSE:	MODE MEMCACHE The ON parameter to the MEMCACHE option has been specified while the cache memory controller is enabled.
ACTION:	None.
MESSAGE:	Monitor type incompatible.
CAUSE:	MODE SELECT The requested mode is not supported by your monitor.
ACTION:	Turn off the power and attach another monitor to your system. Re-enter the command.
MESSAGE:	Page Frame Base Address adjusted.
CAUSE:	CEMM An invalid page frame base address (M*x* parameter) has been set. The driver uses the default value.
ACTION:	None.
MESSAGE:	Sector size adjusted.
CAUSE:	VDISK You have specified a sector size other than 128, 256, or 512. VDISK has adjusted the sector size upward to the next acceptable value.
ACTION:	None.
MESSAGE:	Size of expanded memory pool adjusted.
CAUSE:	CEMM There is not enough extended memory to meet specified request for expanded memory.
ACTION:	None.

MESSAGE:	Transfer size adjusted.
CAUSE:	VDISK You have either not specified the maximum number of sectors to transfer at one time to extended memory, or you have specified a value that is outside of the acceptable range of 1 to 8. VDISK has adjusted the transfer size to the default value of 8 sectors.
ACTION:	None.
MESSAGE:	Unable to activate CEMM.
CAUSE:	CEMM An error occurred when the utility attempted to reactivate CEMM.
ACTION:	None.
MESSAGE:	Unable to de-activate CEMM.
CAUSE:	CEMM An error occurred when the utility attempted to deactivate CEMM.
ACTION:	None.
MESSAGE:	Unable to disable Weitek Coprocessor support.
CAUSE:	CEMM There is no Weitek coprocessor in the system. or An error occurred when the utility attempted to disable the COPROCESSOR.
ACTION:	If you have a Weitek coprocessor installed in the system, consult your Authorized COMPAQ Computer Dealer.

MESSAGE:	Unable to enable Weitek Coprocessor support.
CAUSE:	CEMM There is no Weitek coprocessor in the system. or An error occurred when the utility attempted to enable the coprocessor.
ACTION:	If you have a Weitek coprocessor installed in the system, consult your Authorized COMPAQ Computer Dealer.
MESSAGE:	Unable to place CEMM in Auto mode.
CAUSE:	CEMM The CEMM driver returned an error to the CEMM utility when an attempt was made to place CEMM in AUTO mode.
ACTION:	None.
MESSAGE:	USAGE: CEMM [ON | OFF | AUTO] [W=ON | W=OFF]
CAUSE:	CEMM An invalid parameter was specified when using the *CEMM.COM* utility.
ACTION:	Retry the command with a valid parameter.
MESSAGE:	VDISK not installed — insufficient memory.
CAUSE:	VDISK You specified the /E switch without having extended memory installed, less than 64 Kbytes of memory was available during the VDISK installation, or installing VDISK would have exceeded the number of allowable sectors.
ACTION:	Retry the operation using different parameters.

MESSAGE:	Warning: All VDISKs deleted.
CAUSE:	INSTALL All VDISKs have been deleted from the configuration.
ACTION:	None.
MESSAGE:	Warning: Alpha input required.
CAUSE:	INSTALL A non-alphabetic entry has been made in a field requiring alphabetic entry.
ACTION:	Enter an alphabetic character.
MESSAGE:	Warning: Buffer size rounded down to nearest multiple of 16 Kbytes.
CAUSE:	INSTALL The size specified is not a multiple of 16 Kbytes.
ACTION:	None.
MESSAGE:	Warning: CEMM in current configuration must be ON or AUTO for CACHE to function in expanded memory.
CAUSE:	INSTALL CACHE is installed in expanded memory in the current configuration, which would require CEMM to be ON.
ACTION:	Turn CEMM ON.
MESSAGE:	Warning: Current [CACHE | CEMM | VDISK] is newer, file not copied.
CAUSE:	INSTALL The date of the device driver files on your system disk is a newer version.
ACTION:	None.

MESSAGE:	Warning: Current configuration has an expanded memory xxx Kbyte CACHE. CEMM size is too small to support a CACHE of this size.
CAUSE:	INSTALL The configured CEMM size is too small for the CACHE memory size specified.
ACTION:	Increase CEMM size.
MESSAGE:	Warning: Current configuration has an expanded memory CACHE which requires CEMM to be ON.
CAUSE:	INSTALL The current configuration requires CEMM to be turned on.
ACTION:	Turn CEMM ON.
MESSAGE:	Warning: Entered size is not within valid range from xxx to xxxx Kbytes. Size has been reset to the default of xxx Kbytes.
CAUSE:	INSTALL You have specified an invalid CACHE size.
ACTION:	Enter a valid size.
MESSAGE:	Warning: Extended memory is not supported on this machine.
CAUSE:	INSTALL You selected extended memory on a 8086/88-based machine and none is installed.
ACTION:	None.

MESSAGE:	Warning: Invalid directory entry.
CAUSE:	INSTALL An invalid directory specification has been entered.
ACTION:	Enter a valid directory specification.
MESSAGE:	Warning: Invalid system disk. System disk defaulted to C:.
CAUSE:	INSTALL The selected system disk cannot be accessed or is a network device.
ACTION:	Enter a valid system disk drive letter or accept the default.
MESSAGE:	Warning: Maximum size for current configuration is xxxx Kbytes.
CAUSE:	INSTALL The size value you entered is greater than the amount of memory currently available.
ACTION:	Enter a size within the available memory.
MESSAGE:	Warning: Modifications have been made to your configuration. Do you wish to save the configuration? (Y/N): [Y]
CAUSE:	INSTALL You chose to exit the program after modifications were made to the configuration.
ACTION:	Save the configuration or exit without saving the configuration.

MESSAGE:	Warning: Numeric input required.
CAUSE:	INSTALL A non-numeric entry has been made in an edit field requiring numeric entry.
ACTION:	Enter a number.
MESSAGE:	Warning: Option ROM or RAM detected within page frame.
CAUSE:	CEMM CEMM detected an option ROM or RAM located within the page frame's address range specified.
ACTION:	Remove CEMM or change page frame address.
MESSAGE:	Warning: This choice is unavailable. Request help to obtain information on this choice.
CAUSE:	INSTALL An INSTALL option is not available for the current configuration.
ACTION:	None
MESSAGE:	Warning: This page frame conflicts with an option ROM or RAM.
CAUSE:	INSTALL A page frame buffer address was selected and it conflicts with an option ROM or RAM.
ACTION:	Change the page frame address.

MESSAGE:	Warning: Unable to [locate | delete | rename | open | read | write | create]<path><filename>.
CAUSE:	INSTALL The path directory specified does not contain a CEMM, VDISK, or CACHE device driver.
ACTION:	Ensure that the device driver files are in the path directory.
MESSAGE:	Wrong video controller/display present.
CAUSE:	ADAPT An attempt was made to run ADAPT on a computer that is not equipped with a COMPAQ Dual-Mode Plasma Display.
ACTION:	Do not use ADAPT on a system that is not equipped with a COMPAQ Dual-Mode Plasma Display.